State of Louisiana
Department of Transportation and Development (DOTD)
Materials Section Qualification Procedure
for

ADMIXTURES FOR PORTLAND CEMENT CONCRETE

MATERIAL SPECIFICATION REFERENCE:

DOTD Standard Specifications, Subsection 1011.02 and Physical Requirements for Source Approval (copies attached).

PRELIMINARY REQUIREMENTS:

Approved Materials Evaluation Form

The manufacturer shall submit a standard "Approved Materials Evaluation Form" (copy attached) to the DOTD Materials and Testing Section Coordinator listed below, along with a letter requesting evaluation for the Approved Materials List.

General Information

Include all pertinent information relative to the product to be evaluated; including, but not limited to, agitation requirements, manufacturer's recommended dosage rate range; and basic composition such as carboxylic acids, lignosulfonic acids, neutralized vinsol resin and Safety Data Sheet (SDS).

Certification and/or Test Reports

An infrared spectrophotometric analysis and acceptable physical test data indicating that the admixture will conform to all DOTD specification requirements (see attached physical requirements for admixture source approval and Subsection 1011.02) when tested at a specific dosage within the manufacturer's recommended range must be submitted prior to evaluation. Tests must be run using DOTD mixing and testing procedures as shown under TEST REQUIREMENTS. All tests on the plastic concrete in addition to tests for compressive strength shall be conducted on concrete containing DOTD approved sources of aggregate and cement. . The following information shall be reported to the DOTD coordinator for each product submitted:

1. Proportions of materials used in the control mix and the mix containing the admixture (hereafter referred to as test mix) should be made according to DOTD TR 224.

2. Sources of Materials: manufacturer must include source code for

   a) aggregates
   b) cement

3. Properties of the plastic concrete as follows:

   a) Slump of the control mix and test mix (AASHTO T 119).
   b) Air content of the control mix and test mix (AASHTO T 152).
   c) Initial and final set times for the control mix and test mix if required for the admixture under test (AASHTO T 197).
   d) Set time deviations of the test mix from the control mix, if required.
   e) Resulting water reduction expressed as a percentage of the control mix, if required for the admixture under test.
   f) Actual unit weights of the control mix and test mix.
   g) Actual cement factors of control and test mixes expressed as bags per cubic yard.

4. Properties of the hardened concrete as follows:

   a) The average compressive strengths, at various ages, of the control and test mixes shall be reported. The test ages required are shown in Section 1011, Table 1011-1.
   b) Percent of control for average compressive strength at each age tested.
   c) The average test values for flexural strength, drying shrinkage, and durability factors for the control and test mixes if required for the admixture under test. These values may be obtained from tests on concrete mixes prepared in accordance with ASTM or AASHTO procedures not necessarily using DOTD approved sources of aggregate and cement.
   d) Percent of control for the above properties as required for the admixture under test.

5. Chloride content, solids content, and IR curve representing the admixture.

Sample (to be furnished at no cost to the Department)

A portion of the admixture (at least a pint) that was actually used in the evaluation test will be taken for chemical analysis.

TEST REQUIREMENTS:

Laboratory Testing

When the above requirements have been satisfied, the qualification sample will be tested by the Materials and Testing Section to verify product conformance. Non-conformance of test results obtained by the Materials and Testing Section with specifications will be cause for rejection of the admixture. Although not required, it may be of benefit to the manufacturer to submit a sufficient quantity of the cement and aggregates used for the preliminary testing so that variables can be eliminated during the verification testing.

Alternate Testing

As an alternate to the above Laboratory Testing, a manufacturer may elect to choose a private, local, and accredited laboratory to perform the preliminary tests required by the Department. The manufacturer and/or the accredited private laboratory representative must submit the mix design and pertinent information to DOTD Coordinator for review. The DOTD Coordinator or their appointee will schedule the date and time prior to the mix date and will be present to witness the testing and mixing operation. The manufacturer is responsible for providing the final evaluation report to the DOTD Coordinator.

The following procedures apply to preliminary testing and verification tests of admixtures for source approval. The temperature of the concrete mixes during the tests on plastic concrete shall be 23 ± 1.7°C (73±3°F).

1. DOTD TR 224 - Method of Proportioning and Mixing Portland Cement Concrete for Admixture Testing.

2. DOTD TR 643 - Method of Test for Determining the Chloride Content in Admixtures for Portland Cement Concrete.

3. AASHTO M 194 - Standard Method of Test for Chemical Admixtures for Concrete - Residue by Oven Drying.

4. AASHTO T 119 - Standard Method of Test for Slump of Hydraulic Cement Concrete.

5. AASTHO T 152 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.

6. AASHTO T 197 - Standard Method of Test for Time of Setting of Concrete Mixtures by Penetration Resistance.

7. AASHTO T 121 - Standard Method of Test for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.

8. ASTM C192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.

9. AASHTO T 22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens.

10. AASHTO T 97 (or ASTM C 78) - Standard Method of Test for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)

11. AASHTO T 161 (or ASTM C 666) - Standard Method of Test for Resistance of Concrete to Rapid Freezing and Thawing.

12. AASHTO T 160 (or ASTM C 157) - Length Change of Hardened Hydraulic Cement Mortar and Concrete.

Field Evaluation

The Department may require a field evaluation to ensure satisfactory performance of the product prior to placement on the Approved Materials List. The manufacturer will be notified in regards to the quantity of material needed and location of the installation. The performance of the material will be accepted based upon its placement and curing characteristic, also its ability to entrain air and reduce water or accelerate setting time or prolong it depending upon type admixture being qualified.

Evaluation Time

Laboratory testing - 2 months

Field evaluation - 12 months

GENERAL:

Upon completion of the evaluation, the submitter will be notified in writing concerning the results of the evaluation and whether the product will or will not be added to the Approved Materials List. The Department reserves the right to reevaluate any product at any time. The Department must be notified in writing of any change in material formulation. Significant changes may require reevaluation of the material.

PROJECT ACCEPTANCE REQUIREMENTS:

Inclusion of your product on the Approved Materials List is not blanket approval for its use.

All products, regardless of prior approval, shall be sampled in accordance with the Materials Sampling Manual

DISQUALIFICATION:

Any product may be removed from the Approved Materials List should any problem develop concerning formulation or performance. The Department must be notified in writing of any change in product formulation or name change. Significant changes may require reevaluation of the product.

REQUALIFICATION:

A product which has been disqualified and removed from the Approved Materials List will be considered for reevaluation only after submission of a formal request along with acceptable evidence that the problems causing the disqualification have been solved.

DOTD MATERIALS AND TESTING SECTION COORDINATOR

Francisco Gudiel, P.E.
Geotechnical & Physical Evaluations Engineer
DOTD Materials and Testing Section
5080 Florida Boulevard
Baton Rouge, La. 70806
(225) 248-4111
Francisco.Gudiel@la.gov

Approved 2-5-15

CHRIS ABADIE, P.E.
DOTD MATERIALS ENGINEER ADMINISTRATOR